CLAIMS

1. A method for bonding a first surface to a second surface made of gold, comprising the following steps:

mixing a solution comprising sulfur-containing alkoxysilane;

treating the gold surface with the solution;

adding sulfur-containing alkoxysilane to an adhesive material;

applying the adhesive material to the gold surface, to a surface of the layer of material or both; and

pressing the gold surface and said first surface against each other while the adhesive material therebetween sets.

2. The method as recited in claim 1, wherein the gold surface is supported by a dielectric substrate.

3. The method as recited in claim 1, wherein said first surface is made of a metal.

4. The method as recited in claim 1, wherein said first surface is made of an electrically conductive material.

5. The method as recited in claim 1, wherein said first surface is also made of gold.

6. The method as recited in claim 1, wherein the concentration of sulfur-containing alkoxysilane in the solution is in the range of 0.1 to 10%.

7. The method as recited in claim 1, wherein the concentration of sulfur-containing alkoxysilane in the adhesive material is in the range of 0.1 to 10%.

8. The method as recited in claim 1, wherein the sulfur-containing alkoxysilane is mercaptopropyl trimethoxysilane.

9. The method as recited in claim 1, wherein the sulfur-containing alkoxysilane is disulfidepropyl triethoxysilane.

10. The method as recited in claim 1, wherein the adhesive material is bisphenol-A epoxy resin and said curing step uses an aliphatic amine curing agent.

11. A method for laminating a first substrate to a second substrate, the mutually confronting surfaces of at least one of said first and second substrates being covered at least partially with gold, comprising the following steps:

mixing a solution comprising sulfur-containing alkoxysilane;

treating each gold confronting surface with the solution;

adding sulfur-containing alkoxysilane to an adhesive material;

applying the adhesive material on at least one of the confronting surfaces of said first and second substrates; and

holding said first and second substrates in a fixed relationship while the adhesive material therebetween sets.

12. The method as recited in claim 11, wherein the concentration of sulfur-containing alkoxysilane in the solution is in the range of 0.1 to 10%.

13. The method as recited in claim 11, wherein the concentration of sulfur-containing alkoxysilane in the adhesive material is in the range of 0.1 to 10%.

14. The method as recited in claim 11, wherein the sulfur-containing alkoxysilane is mercaptopropyl trimethoxysilane.

15. The method as recited in claim 11, wherein the sulfur-containing alkoxysilane is disulfidepropyl triethoxysilane.

16. The method as recited in claim 11, wherein the adhesive material is bisphenol-A epoxy resin cured using an aliphatic amine.

17. A structure comprising cured epoxy bonded to a gold surface, wherein said epoxy has a sulfur-containing alkoxysilane blended therein.

18. The structure as recited in claim 17, wherein the concentration of sulfur-containing alkoxysilane in the epoxy is in the range of 0.1 to 10%.

19. The structure as recited in claim 17, wherein the sulfur-containing alkoxysilane is mercaptopropyl trimethoxysilane.

20. The structure as recited in claim 17, wherein the sulfur-containing alkoxysilane is disulfidepropyl triethoxysilane.

21. A laminated structure comprising first and second substrates having mutually confronting surfaces, the mutually confronting surfaces of at least one of said first and second substrates being covered at least partially with gold, and the mutually confronting surfaces being bonded by a thin layer of adhesive material, wherein the adhesive material has an adhesion-promoting agent blended therein, said adhesion-promoting agent being a sulfur-containing alkoxysilane.

22. The laminated structure as recited in claim 21, wherein the concentration of sulfur-containing alkoxysilane in the adhesive material is about 1%.

23. The laminated structure as recited in claim 21, wherein the sulfur-containing alkoxysilane is mercaptopropyl trimethoxysilane.

24. The laminated structure as recited in claim 21, wherein the sulfur-containing alkoxysilane is disulfidepropyl triethoxysilane.

25. The laminated structure as recited in claim 21, wherein the adhesive material is bisphenol-A epoxy resin cured using an aliphatic amine.

26. The laminated structure as recited in claim 21, wherein both of the mutually confronting surfaces are at least partially covered with gold.

27. The laminated structure as recited in claim 21, wherein said first substrate is made of piezoelectric ceramic material and said second substrate is made of dielectric material.

28. An ultrasound transducer device comprising:

an array of ultrasound transducer elements, each of said ultrasound transducer elements comprising a respective terminal made of electrically conductive material;

a printed circuit comprising an array of traces or pads, said pads or traces being made of electrically conductive material, each pad or trace confronting said terminal of a respective one of said ultrasound transducer elements, said pads or traces being substantially electrically isolated from each other; and

a thin layer of adhesive material disposed between said printed circuit and said array of ultrasound transducer elements, wherein the adhesive material has an adhesion-promoting agent blended therein, said adhesion-promoting agent being a sulfur-containing alkoxysilane.

29. The ultrasound transducer device as recited in claim 28, wherein said printed circuit further comprises a flexible dielectric substrate that supports said pads and said traces.

30. The ultrasound transducer device as recited in claim 29, further comprising an acoustic backing layer, wherein said flexible dielectric substrate is joined to or embedded in said acoustic backing layer.

31. The ultrasound transducer device as recited in claim 28, wherein said array of ultrasound transducer elements is two-dimensional.